UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/786,017	02/26/2004	Denis Babin	MMID 2001	3536

54334 7590 06/04/2007

MOLD-MASTERS LIMITED
233 ARMSTRONG AVENUE
INTELLECTUAL PROPERTY DEPARTMENT
GEORGETOWN, ON L7G-4X5
CANADA

EXAMINER	
EWALD, MARIA VERONICA	
ART UNIT	**PAPER NUMBER**
1722	

MAIL DATE	DELIVERY MODE
06/04/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/786,017	BABIN ET AL.	
	Examiner	Art Unit	
	Maria Veronica D. Ewald	1722	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 March 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *8-12,17-19,22 and 24-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *8-12,17-19,22 and 24-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *11/06-5/07*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 8 – 9, 11, 17, 19, 22, 24, 26 – 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Deardurff, et al. (U.S. 5,683,731). Deardurff, et al. teach an injection molding apparatus comprising: a hot runner system for supplying a stream of melt (column 3, lines 5 – 10), the hot runner system having an upstream melt passage (item 27 – figure 3), a pair of downstream melt passages downstream from the upstream melt passage and disposed substantially transverse to the upstream melt passage (items 32a and 32c – figure 3); and a separate flow rotator disposed at a first junction between the upstream melt passage and the pair of downstream melt passages wherein the flow rotator is substantially cylindrical (item 10 – figures 1 and 3b; column 4, lines 1 – 5) and includes an inlet aligned with the upstream melt passage to receive the melt stream from the upstream melt passage (item 28 – figures 1 and 3b), an inlet passage receiving melt from the inlet and following an arcuate path such that a downstream portion of the inlet passage is substantially perpendicular to the upstream melt passage (figures 1 and 3b) and a first outlet passage and a second outlet passage communicating with the inlet passage such that the flow of melt is split into two streams

at a second junction between the inlet passage and the outlet passages (items 32a and 32c – figures 1 and 3b), wherein each outlet passage has a curved path from the second junction to a respective first and second outlet (items 22a and 22d – figure 1 and 1A), wherein the first and second outlets are disposed on opposite sides of the flow rotator (figure 1), wherein the first and second outlets each communicate with a respective one of the pair of downstream melt passages such that melt flow from the upstream melt passage is substantially equally divided to flow in opposite directions in the pair of downstream melt passages (figure 1; column 4, lines 12 – 40) and a plurality of hot runner nozzles in communication with and downstream form the downstream melt passages (column 3, lines 5 – 15); wherein the hot runner system is disposed in a manifold (column 3, lines 5 – 15; column 6, lines 32 – 40); wherein the flow is non-planar (figure 1 and 1A); wherein the flow rotator comprises a one-piece body (column 4, lines 1 – 10).

With respect to claims 19, 22, and 24, the reference teaches a hot runner system for supplying laminar flowing material, the hot runner system having an upstream melt passage (item 27 – figure 3), and a pair of downstream melt passages downstream from and substantially transverse to the upstream melt passage (items 32a and 32c – figures 1 and 3b); a flow rotator for rotating a cross-sectional asymmetrical condition of a laminar flowing material in the hot runner system (item 10 – figures 1 and 3b), the flow rotator comprising: an inlet for receiving the laminar flowing material (item 28 – figure 3b), an inlet passage for receiving the laminar flowing material from the inlet, the inlet passage bending such that a downstream portion of the inlet passage is substantially

perpendicular to the upstream passage (figures 1 and 3b); and a first and second outlet passages communicating with the inlet passage such that the laminar flowing material is split into two streams at a junction between the inlet passage and the outlet passages (items 22a and 22d – figure 1), wherein each outlet passage has a curved path from the junction to a respective first and second outlet (figure 1), wherein the first and second outlets each communicate with a respective one of a pair of downstream melt passages such that the laminar flowing material from the upstream melt passage is substantially equally divided to flow in opposite directions in the pair of downstream melt passages (figures 1 and 3b), wherein the flow rotator is substantially cylindrically shaped plug (item 10 – figure 1; column 4, lines 1 – 5, 45 – 50); wherein the junction is offset from a plane including the upstream melt passage, and the pair of downstream melt passages (figures 1 and 3b); wherein the flow rotator comprises a one-piece body, wherein the inlet, the inlet passages, the outlet passages and the two outlets are formed in the one-piece body (item 10 – figures 1 and 3b; column 4, lines 1 – 5, 27 – 40).

With respect to claims 26 – 27, Deardurff, et al. also teach an injection molding apparatus, comprising: an injection manifold having a first melt channel (item 27 – figure 3) and a second melt channel (items 32a – 32d – figure 3), wherein the second melt channel is substantially transverse with respect to the first melt channel (figure 3); a separate plug having a cylindrical body disposed within the manifold at a first junction between the first melt channel and the second melt channel (item 10 – figure 3b), the separate plug including: an inlet aligned with the first melt channel and having an unrestricted flow path to receive a stream of melt flowing through the manifold (item 28

– figures 1 and 3b), an inlet passage following an arcuate path such that a downstream portion of the inlet passage is substantially perpendicular to the first melt channel (figures 1 and 3b), and a first outlet passage and a second outlet passage communicating with the inlet passage such that the flow of melt is split into two streams at a second junction between the inlet passage and the outlet passages, wherein each outlet passage has a curved path from the second junction a respective first and second outlet (items 22a and 22d – figures 1 and 3b), wherein the first and second outlets are disposed on opposite sides of the plug (figures 1 and 3b), wherein the first and second outlets each communicate with the second melt channel such that melt flow from the first melt channel is substantially equally divided to flow in opposite directions in the second melt channel (figures 1 and 3b); wherein the second junction is offset from a plane including the first melt channel and the second melt channel (figures 1 and 3b).

Claims 28 – 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Beaumont, et al. ("Solving Mold Filling Imbalances in Multi-cavity Injection Molds"). Beaumont, et al. teach an injection manifold having a primary runner and two secondary runners, a plane defined by the primary runner and the secondary runners; and a flow rotating plug installed in the injection manifold to connect the primary runner and the secondary runners (paragraph B; page 51), the flow rotating plug defining: an inlet conduit having an arcuate path extending between an inlet and an intersection offset from the plane, the inlet being connected to the primary runner; and two outlet conduits, each outlet conduit extending in a curve from the intersection back

to the plane and to a respective outlet connected to a respective one of the secondary runners (figure 8; paragraph B; page 51); wherein the flow rotating plug comprises a one-piece body defining the inlet conduit and the two outlet conduits (paragraph B; page 51); wherein an axis of the inlet conduit at the intersection is substantially perpendicular to the plane (figure 8); wherein the two outlet conduits are fully defined by the flow rotating plug (figure 8; paragraph B; page 51); wherein the two outlet conduits are partially defined by the injection manifold (first paragraph; page 47; paragraph B; page 51).

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 10, 18 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Deardurff, et al. in view of Beaumont, et al. (U.S. 6,503,438). Deardurff, et al. teach the characteristics previously described but do not teach that the hot runner system is disposed in a stack mold nor teach the presence of a heating element; however, it is known to one of ordinary skill in the art that balance of flow is necessary for stack molds and that heat is necessary to maintain the plastic in its fluent state.

For example, Beaumont, et al. teach the use of a flow insert that can be used in injection or stack molds (column 2, lines 1 – 5, 20 – 25). In either apparatus, laminar

flowing material is present, and thus the material flowing near the perimeter experiences high shearing, which results in uneven flow to the mold cavities (column 2, lines 60 – 67). Thus, a flow insert is used to compensate for the shearing effects and equalize flow through the runner system and subsequently to the mold cavities. Furthermore, Beaumont, et al. teach that heating of the plastic melt is necessary and that an integral heating element is included with the rotator plug (column 1, lines 40 – 50).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to include the apparatus of Deardurff, et al. in a stack mold for the purposes of equalizing flow through the hot runner system and minimizing shearing effects to thereby promote equal flow to the mold cavities. Furthermore, it would have been obvious to include an integral heating element for the purpose of maintaining the plastic in its fluent state.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Deardurff, et al. in view of Beaumont, et al. ("Solving Mold Filling Imbalances in Multi-Cavity Injection Molds"). Deardurff, et al. teach the characteristics previously described but do not teach that the rotator is so disposed that the melt curves and returns to the first plane at the first and second outlets.

In a method to minimize flow imbalances in hot runner systems, Beaumont, et al. teach the use of a "melt flipper" which forces the melt flow in a downward path, as it exits the inlet passage and upwards to the outlet (figure 8). Such a configuration virtually eliminates all flow imbalances.

Therefore, it would have been obvious to configure the flow rotator such that the flow path outlet returns to the first plane as structured in the "melt flipper" of Beaumont, et al. for the purpose of improving flow uniformity and minimizing flow imbalances, thereby resulting in equalized flow the mold cavities.

Response to Arguments

15. Applicant's arguments, see pages 15 – 18, filed March 16, 2007, with respect to the rejection(s) of claim(s) 8 – 25 under 102(b) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Deardurff, et al. and Beaumont, et al. Deardurff, et al. teach the use of a flow rotator with an inlet passage comprised of ramps and a central opening which split the inlet flow into two outlet flows or streams, following an arcuate path. Beaumont, et al. teach the use of a "melt flipper" which is inserted into the intersection between primary and secondary runners to minimize flow imbalances. The melt flipper curves the outlet flow into the same plane as the inlet passage.

Conclusion

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maria Veronica D. Ewald whose telephone number is 571-272-8519. The examiner can normally be reached on M-F, 8 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Yogendra Gupta can be reached on 571-272-1316. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MVE

ROBERT DAVIS
PRIMARY EXAMINER
GROUP ~~1300~~ 1722

5/29/07